What Are the Components of Waste Collection and Transport?

Existing waste collection and transport systems often cannot handle the amount of waste generated by large cities with growing populations. When this occurs, waste is disposed of in uncontrolled dumps or openly burned. This type of unmonitored and uncontrolled waste disposal has negative consequences on human health and the environment. Improvements to waste collection and transport can create jobs, decrease open dumping and burning, increase appeal for tourism, and significantly improve public health. This fact sheet provides basic guidelines for planning waste collection and transport activities in cities. These guidelines support an ongoing process of improvements to waste practices through integrated solid waste management (ISWM). A case study at the end of this fact sheet shows how a community in Egypt benefitted from implementing some of these guidelines.

What Are Some Guidelines for Planning Waste Collection and Transport?

Careful planning is critical to utilizing resources efficiently and effectively. The plan should consider factors such as applicable laws and regulations; whether a local or regional approach is most appropriate; available resources and costs; the types, amounts, and locations of waste to be collected and transported; and public acceptance of these activities. The following guidelines can be selectively considered during the planning process for waste collection and transport.

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- **Review existing laws or regulations on waste collection, transport, and disposal.** When designing a waste system, you should determine whether existing national, state, provincial, regional, or local regulations provide adequate legal authority to establish a waste collection, transport, and disposal system. For example, the regulations may specify vehicle types and sizes that can be used for collection, road use limitations (what vehicles may travel on what roads and during what hours), and waste transport safety requirements to reduce the potential harm and exposure to the public. If no such requirements exist in current regulations, the national government may want to rewrite the regulation or address these issues in a national policy and/or decree.

- **Designate one agency to oversee waste collection, transport, and disposal.** The local government should make one agency responsible for waste collection, transport, and disposal. Having a single agency for this task will help eliminate potential overlap and confusion among various government agencies.

- **Determine geographic scope of collection and transport services.** Several local governments may consider combining resources to create a regional collection and transport authority. This alternative is usually more cost-effective and may also reduce the need to site several disposal facilities. If a regional authority approach is selected, communities need to agree on an overall budget and source of funding, then determine how much funding each community will contribute to the program. Many communities also have found they can decrease the cost and improve the quality of service by using private waste collection and transport companies and even cooperatives or micro-enterprises, rather than providing this service themselves.

- **Determine funding, equipment, and labor needs.** After the agency has been selected, you should determine how much labor, equipment, and money to dedicate toward managing waste collection and transport. This decision should be based on at least a basic knowledge of the types and amounts of waste, as well as distances traveled to the waste disposal site. Table 1 lists the advantages and disadvantages of various collection and transport methods. Note that city and rural communities have very different waste collection and transport needs. In rural areas, for example, the most economical method may be manual collection from communal bins. In city areas with established roads, trucks may be used. Enclosed trash containers should be used whenever possible to reduce infestation by insects and rodents. Other factors to consider include vehicle maintenance, frequency of collection, cost of labor, and potential revenues.

Types of Solid Waste Customers

Potential customers may include public housing, private residences, factories or other industrial facilities, construction and demolition sites, office buildings and commercial establishments, and large public institutions such as universities, hospitals, and prisons. In most countries, solid waste generated by a private business is paid for by the company.

- **Determine the type and amount of waste to be processed.** You should identify the types of customers that will be served (see box above). You then need to determine how much waste these customers currently generate, and estimate how much they expect to generate in the future. Future generation rates can be determined by multiplying the following factors: amount of waste generated per person per year, population size, anticipated population growth, and the

number of years the landfill will be in operation. Finally, you should determine what types of wastes are generated—household wastes, bulky items, or construction and demolition wastes. Note that waste composition may vary with climate, type of customer served, and the region's economy (e.g., more plant or vegetation waste may be generated during the growing season). This factor is especially important in tourist or resort areas, where the number of people and the amounts of waste tend to change frequently.

- **Consider a transfer station.** Facilities where waste is transferred from manual or small collection vehicles to larger vehicles before being transported to disposal sites or landfills are called transfer stations. Transfer stations are necessary when disposal sites are located far from the collection areas, or when several communities contribute to the same landfill or waste facility. Transfer stations can also serve as a central location for activities to sort and recover waste.
- **Involve the public.** To address the needs of the community, obtain and consider public input throughout the planning and decision-making process. Obtaining public input also offers opportunities to educate the community about proper waste collection, storage, and disposal. This will help ensure an effective solid waste management system.

Table 1—Waste Collection and Transport Methods

METHOD	ADVANTAGES	DISADVANTAGES
Trucks	■ Carry large loads. ■ Appropriate for hauling over long distances typical in rural areas. ■ Require few workers.	■ Have moderate maintenance costs. ■ Require established roadways.
Trains	■ Carry large loads. ■ Appropriate for transporting waste long distances.	■ Expensive to operate and maintain. ■ Railroad proximity to customers a must.
Barges	■ Carry large loads. ■ Appropriate for transport between coastal communities or on large rivers.	■ Expensive to operate and maintain. ■ Not appropriate for land transport. ■ Must be used in combination with other transport methods.
Transfer stations	■ Serve as an intermediate collection point for small-scale waste haulers (e.g., carts). ■ Appropriate for urban areas where disposal is located far away. ■ Can further support the secondary materials markets (i.e., recycling).	■ Require a dedicated site, maintenance, and site management. ■ May have public opposition due to odors, increased traffic, and illegal dumping and/or open burning.

CASE STUDY

IMPROVED WASTE COLLECTION IN BARDEES, EGYPT

As part of a regional environmental action plan developed by Support for Environmental Assessment and Management (SEAM), a task force consisting of the Egyptian Environmental Affairs Agency and a British consulting firm, communities throughout parts of Egypt were surveyed on environmental issues. In Bardees, a city of 40,000, residents identified waste management as its most important environmental problem.

SEAM worked with local organizations in Bardees to get more detailed opinions from both residents and waste collection workers. Many residents were concerned about inadequate coverage of collection services and the general dirty appearance of city streets. The city's equipment was in poor condition and held a limited amount of waste, which often spilled onto the streets. Collection was inconsistent and incomplete, with 90 percent of residents in smaller streets often not receiving any service. Through community focus groups, SEAM found that approximately 68 percent of residents were willing to pay for improved services. Waste collection workers were consulted to identify disposal patterns and collection needs. SEAM and the local government council also researched the community's existing waste stream and waste management practices. They determined common waste disposal practices and preferred ways to collect waste. The city was collecting trash using tractors attached to trailers that could hold only 2.5 cubic meters (m^3) of waste, and some residents were paying donkey-cart operators to collect their waste.

DEFINITIONS

Nonbiodegradable: Not capable of decomposing under natural conditions.

Regulation: A rule or ordinance by which conduct is regulated or that establishes certain standards or requirements for activities or operations.

Source Separated: Separating various wastes at the point of generation (e.g., separation of paper, metal, and glass from other wastes) to make recycling simpler and more efficient.

Transfer Station: Facility where solid waste is moved from collection vehicles to other vehicles for transport to materials recovery or disposal sites.

To improve collection services, SEAM developed a trailer that could accommodate up to 7 m^3 of waste. SEAM helped the city modify its old trailers and saved them for use in outlying areas and emergencies. The city purchased hand carts for collection from narrow streets, set schedules for morning collection, and gave uniforms to the staff of 17 sweepers. To educate residents and gain their participation, SEAM and the local government council worked with three local religious organizations to coordinate community awareness activities. One organization, for example, reached out to women through its literacy classes, sewing center, and daycare center. Another organization distributed leaflets to shops urging them to put their waste in garbage bins.

With its residents involved and understanding their role in keeping the community clean, Bardees has successfully improved its collection services and cleaned up its streets. While the city is currently paying all the operating costs for waste collection, it is working with an NGO to start collecting user fees from residents and businesses. For more information on SEAM's waste management activities, visit <www.seamegypt.com>.

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